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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
REDDY, KARUNA P				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/586,134

**Applicant(s)**

MICHL ET AL.

**Examiner**

KARUNA P. REDDY

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10,11 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-11 and 13-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This office action is in response to amendment filed 9/30/2008. Claims 1-9, 12 and 19 are cancelled; and claim 10 is amended. Accordingly, claims 10-11 and 13-18 are currently pending in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 10-11 and 13-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 10 recites "wherein the thermally polymerizable mixture does not comprise monomers other than the multifunctional macromonomer." There is no support for this recitation in the originally filed disclosure.

Claims 11 and 13-18 are subsumed by this rejection because of their dependence on independent claim 10.

***Rejections - 35 USC § 103***

5. Claims 10-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213).

Arkens et al disclose aqueous coating composition containing a polyacid and a polyol. The composition may be used as a binder for heat resistant nonwovens such as fiber glass (abstract). The addition polymer must contain at least two carboxylic acid groups such as (meth)acrylic acid, anhydride groups or salts thereof (column 4, lines 1-2) and read on the one or more free radically polymerizable double bonds. The polyol may be a compound with a molecular weight less than about 1000 bearing at least two hydroxyl groups such as ethylene glycol, glycerol, 1,4-cyclohexane diol (column 6, lines 1-6). The addition polymer containing at least two carboxylic acid groups may have a molecular weight preferably from about 10,000 to 100,000 (column 4, lines 28-29). The polymerization reaction may be initiated by using the thermal decomposition of an initiator to generate free radicals to effect polymerization (column 5, lines 6-11). In one embodiment the carboxyl or anhydride-containing additional polymer, the polyol and the phosphorus-containing accelerator may be present in the same addition polymer (column 7, lines 5-9). The curable aqueous composition may be used as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and glass fibers (column 8, lines 24-29). The water-borne formaldehyde-free composition after it is applied to a nonwoven, is heated to affect drying and curing (column 8, lines 42-43). The heat resistant nonwovens may be used for applications such as insulation batts or rolls, as reinforcement scrim in cementitious and non-cementitious coatings for masonry (column 8, lines 61-67).

Arkens et al fails to exemplify contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Arkens et al teach in the general disclosure use of curable aqueous composition as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and glass fibers and polymerization of the reaction mixture. Therefore, it would have been obvious to coat the substrate with polymerizable mixture of Arkens et al, because Arkens et al teaches coating a substrate such as certain polyester fibers, rayon fibers and glass fibers, as well as the polymerization of the binder material and one of ordinary skill in the art would expect polymerization to work after coating the substrate with polymerizable mixture.

6. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213) in view of Rockrath et al (US 6, 835, 420 B1).

The discussion with respect to Arkens et al in paragraph 5 above is incorporated herein by reference. Furthermore, the composition can comprise a polyacid containing at least two carboxylic acid groups or the salts thereof and a highly reactive polyol containing at least two hydroxyl groups wherein the ratio of the number of equivalents of said carboxylic groups, anhydride groups or salts thereof to the number of equivalents of said hydroxyl groups is from about 1/0.01 to about 1/3 (column 7, lines 18-26) and reads on the percentages of claim 15. The polymerization reaction to prepare addition polymer may be initiated by thermal decomposition of an initiator (column 5, lines 6-8).

Arkens et al is silent with respect to reacting the product obtained with at least one epoxy compound and subsequently reacting with polyisocyanate; and the polymerization initiator.

However, Rockrath et al teach binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent (abstract). For thermally sensitive substrates it is advantageous to choose a temperature range which does not exceed 100°C. In view of these temperature conditions, hydroxyl groups and isocyanate groups or carboxyl and epoxy groups have proven advantageous as complimentary functional groups (column 8, lines 54-59). Therefore, it would have been obvious to one skilled in the art at the time invention was made to add polyisocyanate as a crosslinking agent to the binder of Arkens et al after reacting with epoxy crosslinker because the binder of Arkens et al comprises both carboxyl and hydroxyl groups and Rockrath et al have proven successfully that carboxyl and epoxy or hydroxyl and isocyanate are advantageous as complimentary functional groups in the binder for curing at low temperatures and one of ordinary skill in the art would expect such crosslinkers to work for the binder of Arkens et al, motivated by expectation of success.

With respect to polymerization initiator, Rockrath et al further teach that, as copolymerization initiator it is preferred to use initiators which form free radicals such as dialkyl peroxides, azobisisobutyronitrile and others (column 10, lines 66-67; column 11, lines 1-12). The strength and amount of initiator are customarily chosen in such a way that the supply of free radicals is constant. Therefore, it would have been obvious to one skilled in the art at the time of invention to use the free radical initiators of Rockrath et al in an amount (as in present claims) that provides constant supply of free radicals during polymerization because Arkens et al contemplate using thermal initiator, known in the art, during polymerization of addition polymer and Rockrath provides list of thermal

initiators that can be used in amounts that generate constant supply of free radicals during polymerization, motivated by expectation of success.

7. Claim 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938) as evidenced by Fujioka et al (JP 60-163914).

Beck et al disclose a radiation curable catalyst by reacting a) 1 equivalent of a dihydric to hexahydric oxyalkylated  $C_2-C_{10}$  alcohol with b) from 0.05 to 1 equivalent of a dibasic to tetrabasic  $C_3-C_{36}$  carboxylic acid or its anhydride and c) from 0.1 to 1.5 equivalents of acrylic acid and/or methacrylic acid and reacting the excess carboxyl groups with an equivalent amount of epoxide compound (abstract). To avoid premature polymerization, the esterification is advantageously carried in the presence of small amounts of inhibitors (column 2, lines 66-68). It is noted that, phenothiazine listed as a polymerization inhibitor is known to function as polymerization initiator as evidenced by the teachings of Fujioka et al (abstract). After esterification, carboxyl groups of the acrylate resin and the excess acrylic acid or methacrylic acid are reacted with epoxide compounds (column 3, lines 14-21).

Beck et al is silent with respect to the use of coating composition on fibrous or granular substrates.

However, Beck et al's binder is generic to all coatings. Furthermore, for economical processability, in general low raw material and high reactivity are important with regard to the binder (column 1, lines 26-27). For economical processability, in general low raw material costs and high reactivity are important with regard to the binder, as well as a low requirement of reactive diluent for obtaining suitable processing viscosities (column 1, lines 26-30). The object of this invention is to provide coating

materials which have substantially lower contents of volatile and physiologically unacceptable acrylic compounds, whose requirement of reactive diluents is very low and which can be processed to give high quality coatings (column 1, lines 60-66). Therefore, it would have been obvious to esterify the reaction mixture after coating the substrate such as fibrous and/or granular substrates, because Beck et al teaches both esterification and generic use of the product as a binder in coatings comprising low content of volatile and physiologically unacceptable acrylic compounds, with suitable processing viscosities that can be processed to give high quality coatings.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938) in view of Rockrath et al (US 6, 835, 420 B1).

The discussion with respect to Beck et al in paragraph 7 above is incorporated here by reference.

Beck et al differs in further reacting the multifunctional macromonomer with a polyisocyanate.

However, Rockrath et al teach binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent (abstract). For thermally sensitive substrates it is advantageous to choose a temperature range which does not exceed 100°C. In view of these temperature conditions, hydroxyl groups and isocyanate groups or carboxyl and epoxy groups have proven advantageous as complimentary functional groups (column 8, lines 54-59). Therefore, it would have been obvious to one skilled in the art at the time invention was made to add polyisocyanate as a crosslinking agent to the binder of Beck et al because the binder of Beck et al comprises hydroxyl groups in addition to carboxyl



groups and Rockrath et al have proven successfully that hydroxyl and isocyanato are advantageous as complimentary functional groups in the binder for curing at low temperatures and one of ordinary skill in the art would expect such crosslinkers to work for the composition of Beck et al, motivated by expectation of success.

9. Claims 10-11, 13-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockrath et al (WO 01/12736).

It is noted that WO 01/12736 (WO) is being utilized for date purposes. However, the US equivalent for WO, namely, Rockrath et al (US 6, 835, 420 B1) is referred to in the body of rejection below. All column and line citations are to the US equivalent.

Rockrath et al disclose a binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent. The binding agent contains in an integrally polymerized form, at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). Examples of suitable binders include acrylate copolymers (column 9, lines 12-15). Preferred acrylate copolymers (column 9, line 28) prepared by polymerizing polysiloxane macromonomer i.e. m3 (column 9, line 38) have a number average molecular weight of from 1500 to 10,000 (column 9, lines 48-49) and reads on the molecular weight of multifunctional macromonomer of present claims. The olefinically unsaturated double bonds of the polysiloxane macromonomers for inventive use are present in acrylic, methacrylic, vinyl, and/or allyl groups (column 7, lines 21-22). The monomer mixture is polymerized with one or more polymerization initiators (column 10, lines 61-63) and includes dialkyl peroxides, t-butyl perethylhexanoate and azobisisobutyronitrile (column 11, lines 5-11). Suitable substrates include fiber

composites, glass fibers and rock wool (column 19, lines 33-40). See example 1, wherein the coating composition comprises hexaacrylate-functional polysiloxane macromonomer in the monomer mixture and initiator solution of t-butyl perethylhexanoate in amount of about 2% by weight relative to the monomer content (column 24, lines 16-44).

Rockrath et al differ with respect to polymerizing the polymerizable mixture prior to contacting the substrate.

However, court held that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to coat i.e. contact the substrate with polymerizable mixture prior to polymerization, instead of contacting the substrate after polymerization of polymerizable mixture, absent evidence of unexpected results.

### ***Response to Arguments***

10. Applicant's arguments, filed 9/30/2008, with respect to prior art rejections in paragraphs 4 and 6-7 of office action mailed 5/30/2008, have been fully considered and are persuasive. The prior art rejection in paragraphs 3-4 and 6-7 of office action mailed 5/30/2008 has been withdrawn in view of the amendment.
11. Applicant's arguments, filed 9/30/2008, have been fully considered but they are not persuasive. Specifically, applicant argues that (A) support for the exclusion of "monomers" in thermally polymerizable mixture comes from the disclosure on page 2, lines 8-9 of present disclosure; (B) Beck contains methyldiethanolamine, which is a

monomer; and (C) Rockrath's polymerization solution includes a polysiloxane macromonomer and other monomers.

With respect to (A), applicant's attention is drawn to disclosure (bridging paragraph 1-2) from which it is clear that the statement at page 2, lines 8-9 is in reference to the already known prior art of DE-A-44 21 254, and not in reference to the polymerizable mixture of present invention. In addition, there is a specific reference to the macromonomers of present invention as "prepolymers" of DE-A-44 21 254, without monomers of DE-A-44 21 254.

With respect to (B), given that coating composition is prepared by polymerization of monomers in recited proportions, it is the examiner's position that methyldiethanolamine is present prior to polymerization which results in the formation of the multifunctional macromer. Furthermore, applicant's attention is drawn to Beck et al (column 3, lines 36-40) where it states that coating materials prepared are advantageously crosslinked by electron beams or UV radiation i.e. product formed is crosslinked after preparation of coating material.

With respect to (C), applicant's attention is drawn to new ground of rejection in paragraph 9 above necessitated by amendment and incorporated here by reference. Specifically, Rockrath teaches that the acrylate polymer comprising the polysiloxane macromonomer has a molecular weight of 1500 to 10,000 and meets the macromonomer definition of present claims. Thus, it is the examiner's position that monomers are part of the macromonomer i.e. acrylate copolymer of Rockrath et al and comprises polymerizable double bonds.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

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applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. P. R./  
Examiner, Art Unit 1796

/Vasu Jagannathan/  
Supervisory Patent Examiner, Art Unit 1796